

Applicant : Stephen K. Pinto et al.  
Serial No. : 10/826,630  
Filed : April 16, 2004  
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Attorney's Docket No.: 17146-007001

Amendment to the Drawings:

The attached replacement sheet includes changes to Fig. 1 and replaces the original sheet.

In Figure 1, reference character 25 has been removed. No new matter has been added.

Attachments following last page of this Amendment:

Replacement Sheet (1 pages)

Amended Sheet Showing Change(s) (1 page)

### REMARKS

The comments of the applicant below are each preceded by related comments of the examiner (in small, body type).

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because:
3. As to Figure 1, the newly added reference character '25' is not mentioned in the description.
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The applicant has amended Figure 1.

#### **Claim Objections**

5. Claim 1 line 11 refers to "population of variables", would be better as "population of predictor variables" to avoid any possible antecedent issues.
6. Claim 4 line 2 refers to "of predictor", would be better as "of potential predictor" to avoid any possible antecedent issues.
7. Claim 5 line 3 refers to the term "a third predetermined level of significance". Term raises indefiniteness issues; since its parent claim, claim 1, lacks "a second predetermined level of significance". Claim 3, however, has "a second predetermined level of significance".

The applicant has amended claims 1, 4, and 5.

12. As to claim 1, Cabena discloses a machine-based method comprising in connection with a project in which a user generates a predictive model based on historical data about a system being modeled (see chapter 1.5.1, Pages 9-11): selecting variables having at least a first predetermined level of significance from a pool of potential predictor variables associated with the data, to form a population of predictor variables (see page 101, 2<sup>nd</sup> and 3<sup>rd</sup> paragraphs), extending the population of predictor variables to include non-linear interactions of variables and extending the population of predictor variables to include linear and non-

linear extensions with remaining previously excluded variables (see page 93, 2<sup>nd</sup> paragraph), generating a possible model of the extended population of variables using a subsample of the data by the model generation method (see “Feature Selection” and “Train and Test” in page 95), determining whether the possible model generalizes to the data other than the subsample (see page 101, last paragraph), applying the possible model to all of the data to generate a final model, cross-validating the final model using random portions of the data (see page 97, last paragraph), and interacting with the system being modeled based on the final model (see “To ensure that the model has not overfit the data and to assess the model performance against a data set that has the same characteristics as the application universe, the model should be executed against the test data in test mode” in page 102, 1<sup>st</sup> paragraph, lines 1—5 and “After having iteratively improved the models, you chose the best model” in page 102, 3<sup>rd</sup> paragraph, line 1).

13. While Cabena discloses generating a predictive model based on historical data about a system being modeled, Cabena fails to disclose automatically selecting a model generation method from among a set of available model generation methods to match characteristics of the historical data.

14. Harrison discloses automatically selecting a model generation method from among a set of available model generation methods to match characteristics of the historical data (see page 233, col. 2, next to last paragraph, last 7 lines).

15. Cabena and Harrison are analogous art because they are both related to predictive modelling.

16. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the automatic model selection of Harrison in the method of Cabena because Harrison explore the possibility of the integration of expert systems technology with a forecasting decision support system (see page 229, col. 1, lines 1—4), and as a result, Harrison reports that testing of his prototype shows that the system is useful for managers who have no forecasting technique and computing background and want to improve their decision making by means of quantitative forecasting (see page 235, col. 2, next to last paragraph).

The applicant disagrees. Claim 1 recites, in part, “extending the population of predictor variables to include linear and non-linear extensions with remaining previously excluded variables.” For example, in one implementation in the application, when an analyst selected the reduce dimension button, “the variables that fall below the cut-off line are excluded, ... but later in the process, the analyst can re-include the variable[s] based on other considerations.” (page 34, lines 6-10) Accordingly, a filter that “generates by forward stepwise OLS all combination of the augmented sets of variables,  $X^*$ , summed with [a] set Z, initially rejected variables, e.g.,  $X_h$  or  $(X_j * X_k)$  ...” is used to “exclude a sufficient number of non-significant variables” and present the user with a status of the predictor variables, as shown in FIG. 22. (page 34, lines 15-27) The cited portions of Cabena merely describe generally using automated methods to “linearize, standardize, and remove outliers,” so that the resulting data achieved is “linearly related to an

objective variable, normally distributed, and [contains] no outliers.” (page 93, paragraph 2) Also, Cabena describes creation of new variables “using ratios, differences, and business intuition.” (page 93, paragraph 3) There is nothing in Cabena that describes or makes obvious “extending the population of predictor variables to include linear and non-linear extensions with remaining previously excluded variables ... [and] ... generating a possible model of the extended population of predictor variables.”

...

**44. As to claim 31, Cabena discloses a machine-based method comprising in connection with a project, generating a predictive model based on the historical data (see chapter 1.5.1, Pages 9-11), displaying to a user a lift chart (see page 101, last paragraph, lines 1—5 and page 105, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs), monotonicity (see page 101, last paragraph, last 3 lines and page 119, 2<sup>nd</sup> bullet from the bottom), and concordance scores (see Chapter 1.5.1, Pages 9-11) associated with each step in a step-wise model fitting process (see page 98, 2<sup>nd</sup> paragraph). While Cabena discloses generating a predictive model based on historical data about a system being modeled, Cabena fails to disclose automatically selecting a model generation method from among a set of available model generation methods to match characteristics of the historical data. Harrison discloses automatically selecting a model generation method from among a set of available model generation methods to match characteristics of the historical data about a system being modeled (see page 233, col. 2, next to last paragraph, last 7 lines).**

The applicant disagrees. Claim 31 recites displaying to a user, among others, “concordance scores.” For example, as described in the application, in one implementation, a user can click on a hyperlink to have a browser display “model statistical results ... specifically, “[an] ROC curve ... which gives concordance statistics,” as shown in the screenshot of Figure 23B. The cited portions of Cabena, i.e., Chapter 1.5.1, pp 9-11, merely introduces the technique of “predictive model,” and further, “the predictive modeling approach.” A reference to “scoring,” is found on page 11, paragraph 2, which states:

A specialization of value prediction is scoring, where the variable to be predicted is a probability or propensity. Probability and propensity are similar in that they are both indicators of likelihood. Both use an ordinal scale, that is, the higher the number, the more likely it is that the predicted event will occur. Typical applications are the prediction of the likelihood of fraud or the probability that a customer will respond to a promotional mailing.

There is nothing in the above passage that describes or makes obvious , displaying to a user, among others, “concordance scores.” For at least this reason, claim 31 is patentable.

...

47. As to claim 34, Cabena discloses a machine-based method comprising receiving from separate sources, sets of potential predictor and dependent variables representing historical data about a system being modeled (see page 92, paragraphs 2—5), enabling a user of a model generation tool to combine at least two of the dependent variables from the sets of potential predictor and dependent variables (see “Okay Customer Set”, “Good Customer Set” and “Create Objective Variable” items in page 90, Fig. 46) to generate a model to be used in interacting with the system being modeled (see “To ensure that the model has not overfit the data and to assess the model performance against a data set that has the same characteristics as the application universe, the model should be executed against the test data in test mode” in page 102, 1<sup>st</sup> paragraph, lines 1—5 and “After having iteratively improved the models, you chose the best model” in page 102, 3<sup>rd</sup> paragraph, line 1).

The applicant has amended claim 34. As amended, claim 34 recites “enabling a user ... to combine at least two *models* based on ... dependent variables ... to generate a model to be used in interacting with the system being modeled.” (emphasis added) For example, in one implementation described in the application, “one type of predictive model [e.g., predictive model 232 of figure 13,] may need to be combined ... with at least one other predictive model [e.g., predictive model 234] of the same or different type.”

In contrast, the cited portions, and figure 46, of Cabena describe combining *two variables* to “create [an] objective variable” prior to data preparation, sampling and constructing a model. (page 90, “Create Objective Variable,” page 91, paragraphs 1-3). There is nothing in Cabena that describes or makes obvious “enabling a user ... to combine at least two models based on ... dependent variables ... to generate a model to be used in interacting with the system being modeled.” For at least this reason, amended claim 34 is patentable.

48. As to claim 35, ....

49. As to claim 36, ....

...

52. As to claim 39, ...

53. As to claim 40, ...

All of the dependent claims are patentable for at least similar reasons as those for the claims on which they depend patentable.

**55. Regarding the IDS objections, deficiencies remain.**

**56. About the information disclosure statement filed 5/27/05 and its failure to comply with 37 CFR 1.98(a); Applicant was non—responsive, since no useful information was provided.**

The applicant thanks the examiner for the telephone call of February 11, 2008. In the call, the examiner stated that he would consider, and take into account, the information stated on the cover sheet of the information disclosure statement. Accordingly, the examiner stated that he would issue a statement withdrawing the IDS objection in the next communication.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

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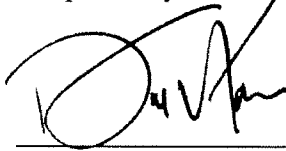
Attorney's Docket No.: 17146-007001

The required fee of \$60 for the Petition for One-Month Extension of Time is being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050, referencing attorney docket number 17146-007001.

Date: \_\_\_\_\_

2/14/8

Respectfully submitted,



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